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Biological & Medical Serials

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OCTOBER, 1918.

ENTOMOLOGICAL NEWS

Vol. XXIX. No. 8.

Benjamin Dann Walsh
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PROPERTY
TORONTO BRANCH
ENTOMOLOGICAL SOCIETY
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PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

Advertising Rates: Per inch, full width of page, single insertion, $1.00; a discount of ten per cent. on insertions of five months or over. No advertisement taken for less than $1.00—Cash in advance.

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Forda formicaria

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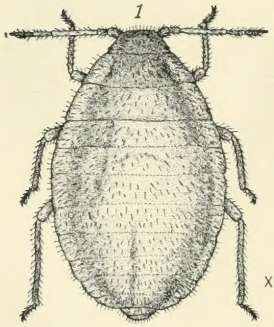

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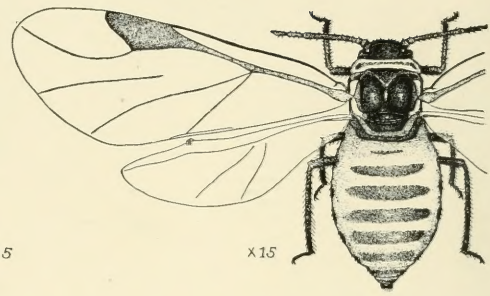

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Forda olivacea

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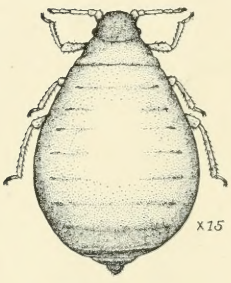

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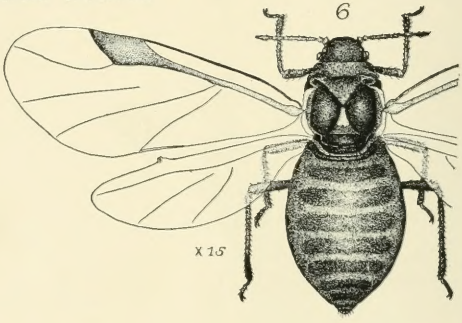

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F. formicaria X 90

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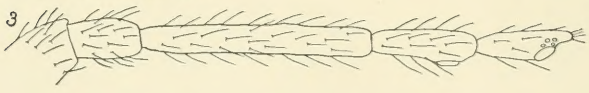

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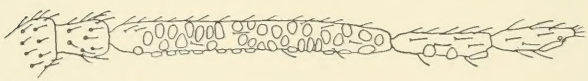

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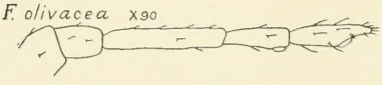

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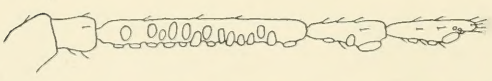

GRASS-ROOT APHIDS.—GILLETTE.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIX. OCTOBER, 1918. No. 8.

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Some Grass-Root Aphids (Hem., Hom.).

By C. P. GILLETTE, Fort Collins, Colorado.

(Plate XVI.)

FORDA Species.

When Heyden, in 1837, characterized this genus from the apterous form of his *formicaria,* he had not seen the winged lice. Other species have been described since, but still no one seems to have discovered that this root-feeding group of aphids develop winged lice in mid-summer that desert the grass roots to seek fresh food-plants. We have been rearing the winged migrants of, at least, two species of *Forda* at the Colorado Experiment Station for several years past. Believing their characterization will be of service in classifying the group, I am giving descriptions of these alate forms with our data upon life habits, and am also including enough of a description of the apterous forms to enable one who does not have the original descriptions to separate them.

Forda formicaria Heyden (Plate XVI, figures 1, 2, 3 and 4).
Syns.: *Rhizoterus vacca* Hartig, *Tychea graminis* Koch, *Forda occidentalis* Hart.

Apterous specimens of this species sent to me by Mr. F. V. Theobald, Wye, England, seem to be identical with one of the common species upon grasses and in ant nests in this country, and both agree well with the original description of *formicaria,* and also with the description given by Mr. Hart, Eighteenth Report of State Entomologist of Illinois, 1894, p. 95, for his *occidentalis;* the latter name, therefore, along with *Rhizoterus vacca* Hartig and *T. graminis* of Koch, are probably synonyms.

Alate Summer Migrant. About June 10th, at Fort Collins, Colorado, the alate form begins to appear and to migrate from the grass roots. At the end of about four to six weeks, the entire colony become winged and leave the host plant, apparently to seek others of the same sort. At least, we find the lice later in the season upon grass-roots again, where they remain all winter, and we have not taken them upon other plants.

This *early summer migrant* may be described as follows: General color of prothorax and abdomen sordid straw yellow; head, meso- and metathorax, antennae, a transverse line on pronotum, veins and stigma of wings, entire legs, cauda and anal plates, a transverse band on each abdominal segment and a small spot on either lateral margin of the segments of the abdomen, black or blackish; at the center of the mesothorax above, a small yellow spot.

Wings hyaline, cross-veins 1 and 2 of the fore wing unite at the base and the third ends abruptly at basal one-third of length, all veins with narrow blackish margin; stigma short, stout, rounded distally, with stigmal vein rising near the middle at the thickest part; hind wing with 2 transverse nerves, the second obsolete at base.

Head and antennae well set with short, curved hairs; head short, broad, vertex slightly bi-lobed; beak reaching hind coxae; antennal joints 1 and 2 sub-equal, 3 about one-half the length of the entire antenna; joint 4 somewhat longer than joint 5 with the small spur; joint 3 with about 30 oval sensoria extending along its entire length; joint 4 with usually 2 sensoria before the large terminal one; joint 5 with a very large sensorium at base of spur. Cauda broadly rounded and twice as broad as long; see Plate XVI, figures 2 and 4. Length 2.70 to 3.; antennae, .80 to .90 mm.

We have taken the alate form from June 2 to July 12 on the roots of grasses.

Apterous Form—The adult apterous form is sordid grayish green in color, is very plump, and set with rather plentiful long fine hairs; the beak reaches to a point half-way between the hind coxae and the tip of the abdomen, and joint 3 of the antenna is distinctly longer than joints 4 and 5 with spur combined; length 2.80 mm. These characters easily separate this species from *F. olivacea.* See figures 1 and 3.

We have taken this species on the roots of *Melica bulbosa, Poa pratensis, Phleum alpinum,* and *Elymus* sp. in Colorado.

Forda olivacea Roh. (Plate XVI, figures 5, 6, 7 and 8).

Alate viviparous female. This is a very abundant louse upon the roots of different grasses. To the naked eye, or by the use of a hand lens, the alate lice appear entirely black. The real color is dark olive green. The head, thorax, antennae, legs, anal plate and a transverse band on each segment of the abdomen on the dorsum are black, or nearly so. In some, the legs, especially the middle pair, show considerable light brown color.

The body is very robust, wings stout and short, stigma short, broad and blackish, especially along the lower margin; cross-veins slender and brown in color, veins 1 and 2 rising near together, but not uniting as in *formicaria;* hind wing with 2 transverse nervures; sub-costal vein very strong and black; transverse veins simple as in *Pemphigus,* stigmal vein rising at center of the under side of the stigma and extending to the tip of the wing.

Joint 3 of the antenna with a poorly defined double row of oval transverse sensoria, about 20 to 24 in number; joint 4 with 2 to 4 large oval sensoria, and joint 5 with 1 or 2 before the large one near the distal end; spur rather short; joint 3 as long as the two following together, including the spur; beak attaining the second coxae. Cauda short, broad, rounded posteriorly.

Length of body, 1.80 to 2.20; wing, 2.50 to 3; antenna, .65 to .70; hind tibia, .75 mm.

Described from numerous specimens taken at Fort Collins, Colorado, by L. C. Bragg, June 25, 1912, and by the writer, June 26, 1915, in both cases from *Hordeum* sp.

Apterous female: Color sordid greenish yellow, head and prothorax a little dusky; legs, antennae, anal and genital plates, and usually 1 or 2 transverse lines on terminal segments of abdomen above, dusky to blackish; antennae, .54 mm. long and 5-jointed; joint 3 shorter than 4 and 5 together; joints 4 and 5 each with sensorium near distal end,

beak barely surpassing 3d coxae; vertex very convex; body of large examples 2.5 by 1.5 mm. very plump, almost globular; cauda very short, oval, set with short hairs only; no cornicles, eyes dusky and small in size; ocular tubercle large but not very prominent; body and appendages very free from hairs.

This is, by far, the more abundant of these two species in Colorado, and does considerable damage to grasses and grains every year. It is most common upon somewhat isolated clumps of grass along the roadside, the borders of the fields and upon ditch banks, where the ground is not often cultivated. The louse colonies work mostly upon the roots, close about the crown of the plants, for the most part within one-half inch of the surface of the ground, and always are accompanied by ants. As a result, the roots are often largely destroyed, the plants stunted and have the appearance of drying out, and are easily pulled from the ground. The lice, being wholly underground, are seldom noticed by the farmer.

While this louse is a very general feeder among the grasses, *Hordeum,* or squirrel-tail grass, and the Agropyrons, or wheat grasses and Kentucky blue grass, seem to be favorites. We have taken this species also on wheat, oats, barley, timothy, *Bromus inermis, B. tectorum,* and species of *Elymus.*

EXPLANATION OF PLATE XVI.

Figures 1 and 2—Apterous viviparous and alate viviparous forms of *Forda formicaria;* 3 and 4 antennae of the same; 5 and 6 apterous and alate forms of *Forda olivacea,* 7 and 8 antennae of the same. Original; Miriam A. Palmer, delineator.

Pyrrhotes haematoloma H. S., and Leptocoris trivittatus Say in Illinois (Hemiptera, Coreidae).

The distribution of the above two coreids as given by Van Duzee in his recently published catalogue does not extend east of the Mississippi River. The first named species is represented in our collection by one specimen taken by the writer at Havana, Illinois, August 30, 1917, in a sand blowout, and several specimens from Texas, one of which was taken at Brownsville by Mr. C. A. Hart. The other species is the very common box-elder bug in connection with the abundance of which in Illinois we receive many letters annually. J. R. MALLOCH, Urbana, Illinois.

New Species of Crane-flies from California (Dip.).

By Charles P. Alexander, Kansas University, Lawrence, Kansas.

The following new species of crane-flies were included in a collection of undetermined material sent to me for naming through the kindness of Mr. Millard C. VanDuzee, to whom I am indebted for this, as well as many other favors in the past.

The types are in the writer's collection.

Family Tanyderidae.

Protoplasa vanduzeei sp. n.

Size small (wing under seven mm.); wing long and narrow, spotted and clouded with grayish, the pattern heaviest on the anterior half of the wing, including the entire costal cell.

♂. Length about 5 mm.; wing 6.3 mm.; greatest width of the wing 1.2 mm.

Rostrum brown; mouth parts and palpi dark brown. Antennae dark brown, short, apparently 16-segmented, the segments with pale hairs. Head light brown with a dark brown dorso-median line.

Pronotum brownish. Mesonotal praescutum light grayish-brown with three brown stripes, the middle stripe broad, split by a narrow pale line; lateral stripes less distinct; remainder of the mesonotum grayish-brown; the scutellum fringed with about 15 long hairs. Pleura light grayish-brown. Halteres dark brown, the extreme base and the stem paler. Legs with the coxae and trochanters pale yellowish-brown, sparsely gray pruinose; femora pale yellowish-brown, the apices darker; tibiae pale brown tipped with darker; tarsi dark brown.

Wings long and narrow, subhyaline with a heavy gray pattern, as follows: costal cell; large clouds at the base of cells *R* and *M*, at the base of *Rs*, along the cord and at the fork of veins *R2+3*; most of these markings lie on the anterior half of the wing, those on the posterior half located at the wing margin at the ends of the longitudinal veins and scattered along the veins as rounded spots. Venation: all veins long and slender, conforming to the extreme narrow shape of the wing; *m-cu* cross-vein obliterated; anal angle of the wing not as distinct as usual in the genus.

Abdominal tergites light brown basally, dark brown on the apical half, the extreme caudal margin narrowly ringed with pale; sternites paler. Hypopygium with the pleural appendages orange, bi-lobed, the dorsal lobe elongate, slender, the ventral lobe short, stout, obtusely rounded.

Holotype: ♂, Los Cerritos, California, March 14, 1915. (M. C. VD.)

This interesting fly is closest to *P. vipio* O. S. but is a very different species, being much smaller and showing unmistakable signs of degeneracy of the wings. I take great pleasure in dedicating this interesting crane-fly to Mr. VanDuzee, who collected the type specimen.

Family TIPULIDAE.

Tribe Eriopterini.

Erioptera (Erioptera) cinctipennis sp. n.

Coloration gray, praescutum with four narrow brown stripes; wings dusky, cross-banded with subhyaline.

♂. Length 4.5-5 mm.; wing 5.4-5.7 mm.

Rostrum and palpi black. Antennae black, short, the flagellar segments short, oval, with a dense pale pubescence. Head dark gray.

Pronotum gray, the scutellum more yellowish. Mesonotal praescutum brownish-gray with four narrow brown stripes, the intermediate pair longer; pseudosutural foveae elongate, conspicuous, jet black, extending obliquely across the segment just in front of the lateral stripes; scutum gray with two brown spots on each lobe; scutellum and postnotum light gray. Pleura clear light gray. Halteres light yellow throughout. Legs with the coxae brown, sparsely gray pruinose; trochanters and femora brown, the latter broadly darkened apically; tibiae and tarsi dark brown.

Wings comparatively narrow, strongly suffused with dark brown, the basal portion of the wings, a broad band before the cord and the broad subapical regions clearer, presenting an appearance of a clear narrow band before the cord and a broader brown band extending from the stigma across the wing; stigma distinct, dark brown; veins dark brown. Venation as in subgenus; *R2+3* usually short, about equal to, or a little longer than, *r* or *r-m;* second anal vein not greatly sinuated.

Abdomen dark brown, the apices and lateral margins of the segments narrowly pale and with sparse golden hairs. Hypopygium more reddish.

Holotype: ♂, Los Angeles, California, April 29, 1915. (M. C. VD.)

Paratopotypes, four ♂, April 26-May 3, 1915.

Paratypes, two ♂, Los Cerritos, California, March 21, 1915. (M. C. VD.)

This handsome species is readily told from related species of the subgenus by its handsomely banded wings, in this respect suggesting the South African *E. peringueyi* Bergroth.

Tribe Limnophilini

Phyllolabis flavida sp. n.

Coloration pale yellow; wings nearly hyaline, stigma lacking; vein *Sc* long, *R2+3* arcuated, about equal to cell *R2* alone; inner end of cell *1st M2*, slightly proximad of *r-m*.

♂. Length 5.3 mm.; wing 5.5 mm. ♀. Length 4.8 mm.; wing 5.8 mm.

Rostrum and palpi pale yellow. Antennae elongate, in the male, if bent backward, extending about to the base of the abdomen, the flagellar segments cylindrical, with moderately long hairs; antennae pale yellowish, the terminal segments darker. Head brownish-yellow; eyes large, black.

Thorax pale brownish-yellow, without distinct stripes. Halteres elongate, pale, the knobs brownish. Legs pale yellowish, the tarsi dark brown.

Wings rather broad, pale, subhyaline, stigma lacking; veins brown. Venation: *Sc* long, ending just before the middle of *R2+3;* in the other described species of the genus *Sc* is much shorter, ending just beyond the fork of the sector; *R2+3* arcuated, shorter than, or subequal to *R2* alone; inner end of cell *1st M2* slightly proximad of *r-m*.

Abdomen pale yellowish, the segments ringed caudally with darker. Segments eight and nine, and the posterior half of seven, black; hypopygium orange-brown. Male hypopygium with the caudal projection of the eighth sternite long, slender, narrow at the base, gradually and slightly expanded toward the apex, which is bilobed and pubescent; just dorsad of this blade are two needle-like blades. Lateral prolongations of the pleurites elongate, curved, fringed at the tips and along the sides with long stout hairs, the apical portion of this arm expanded. Ventral inner pleural appendage sickle-shaped, with a slender handle, the blade widely expanded, curved outwardly, the acute tips directed inwardly; dorsal inner pleural appendages bifid, the inner arm longest and decussate with its fellow of the opposite side.

Holotype: ♂, Alpine, San Diego County, California, April 10, 1915. (M. C. VD.)

Allotype: ♀, with the type.

Related to *P. claviger* O. S. in the lack of a stigmal spot to the wings, but very distinct in its pale coloration, venational details, and, especially, the peculiar male genitalia.

Limnophila (Dactylolabis) nitidithorax sp. n.

Wings deeply suffused with brown, unspotted; body-coloration dark brown, somewhat shiny; legs at the base, including the coxae, yellowish.

♂. Length 6.2-7 mm.; wing 6.4-7.1 mm.

Rostrum and palpi dark brown. Antennae short, dark brown; head broad between the eyes with long scattered black hairs; head brownish-black, very sparsely grey pruinose.

Thoracic dorsum dark brown, without distinct stripes, sublustrous, very sparsely pruinose; dorso-pleural membranes dull brown. Pleura similar to the dorsum. Halteres short, yellow. Legs with the coxae yellowish, the outer faces at the base darkened; trochanters yellow; femora yellow, the tips dark brown; tibiae and tarsi brown.

Wings with a strong brownish tinge; veins dark brown. Venation as in the subgenus; *r* at the tip of *R1*; *R2+3* short to very short; *R2* nearly perpendicular at its origin; cell *M1* deep, longer than its petiole; basal deflection of *Cu1* at, or just beyond, the fork of *M*.

Abdomen dark brownish-black, the caudal margins of the segments and a narrow dorso-median line black; hypopygium black; ventral pleural appendages very long, digitiform, longer than the pleurites.

Holotype: ♂, Berkeley, California, May 16, 1915. (M. C. VD.)

Paratopotypes, three ♂.

The only regional species of this subgenus with the wings unspotted is *L.* (*D.*) *hortensia* Alex. (British Columbia), a grayish fly with quite a different wing-venation.

The Lake Mosquito, Mansonia titillans Walk., and its Host Plant, Pistia stratiotes Linn., in the Canal Zone, Panama (Dip.: Culicidae).

By L. H. Dunn, formerly Entomologist of Board of Health Laboratory, Ancon, Canal Zone.

(Continued from page 269)

We have noted a few virgin females that, when confined in cages, would take a blood meal nearly every day; one specimen took 14 blood meals in 17 days, which is the longest time that we have been able to keep *M. titillans* alive in captivity.

In some instances the bite of this mosquito is quite painful and produces considerable irritation. In other cases their bites

are hardly noticeable. During some experiments recently carried out in an attempt to incriminate this species with the transmission of Dengue fever—which proved negative and were not completed—34 mosquitoes were allowed to become gorged on one patient. These bites extended over a period of five days. They did not cause the patient any itching or pain except a few of them, less than 10 per cent., when the skin was first pierced. Many times the patient could not feel the mosquitoes biting at all. The writer afterwards received 97 bites from these same mosquitoes during a period of 10 days. The only sensation experienced was an occasional slight sting when the mouth parts were first inserted. A slight itching sensation developed in a few of the bitten areas several days later when accidentally rubbed or irritated.

Although *M. titillans* is present throughout all months of the year in the Canal Zone, it is most abundant from late April to early October. During this period it is more numerous in the lake region, and is also found at greater distances from the lake.

While investigating the abundance of this species on the west side of the lake, we visited Mr. J. A. Forsyth on board the house-boat Hyacinth on the evening of October 1, 1915. Mr. Forsyth is in charge of the destruction of the water hyacinths in Gatun Lake. While searching for the hyacinths he visits many obscure parts of the lake, and has been kind enough to keep me informed of the status of the *Pistia,* and has assisted in my observations on this plant in many ways. He had previously informed me of the hosts of mosquitoes that paid nightly visits to the house-boat. Owing to this information an evening visit was made for the purpose of investigation. The boat was anchored about 200 yards from the shore in an arm of the Cano River region, at the west side of the lake, about one and one-half miles west of the Canal route. Two miles west of the place of anchorage the surface of the water, several square miles in area, was covered with packed masses of the *Pistia* plants. All the living quarters of the boat were well screened. The fore deck was unenclosed

and unscreened. At the beginning of dusk the mosquitoes, attracted by our lights, began mobilizing, and soon they were flying about in veritable swarms, and resting on the window and door screens by the hundreds. Wishing to secure specimens for identification, we stepped out on the unscreened fore deck of the boat, and after quickly sweeping a five-inch midget net through the air in a circle a few times, hastily retreated within the protection of the screens. An examination of the contents of the net revealed 39 mosquitoes. All were *M. titillans*. Seven were males and 32 females. In January, 1916, four months later, this house-boat, which was still anchored at the same place, was again visited, but comparatively few mosquitoes came to attack us in the evening.

A considerable amount of interesting information has been obtained concerning the water lettuce, *Pistia stratiotes*, which acts as host plant for *M. titillans* by furnishing the larval and pupal forms with their necessary air-supply. The name *Pistia* was undoubtedly derived from the Greek word *pistos*, meaning watery, this name being probably gained by the plant's aquatic nature. In many of the Spanish-speaking countries of Central and South America this plant is known as "Sirena." In the West Indies it is commonly referred to as Water Lettuce, while in other localities it is termed Tropical Duckweed. The appellative of Water Lettuce is quite suitable for this aquatic herb, as it bears a somewhat superficial resemblance to the ordinary lettuce of the garden variety. It is a tropical and subtropical plant and has a wide distribution, being found in many parts of the world. It is distributed in the United States as far north as North Carolina, being especially abundant in the St. Johns River in Florida; throughout Central and South America and the West Indies; in Africa from Natal to Senegambia and Nubia; in Asia from the East Indies to the Philippine Islands, and on the Madagascar and Mascarene Islands.

Hogg,[5] in speaking of this plant, says, ". . . . in the West Indies, Africa and India, where it is said to absorb the dele-

[5] Hogg's Vegetable Kingdom.

terious gases of the muddy marshes where it grows, and it is perhaps on this account that it is held sacred on the west coast of Africa, the priests consecrating it in vases filled with water in which it is left to grow. A decoction of the plant is considered demulcent and refrigerant, and is prescribed in dysuria and other diseases of the urinary passages. In India the leaves are applied to hemorrhoids. The plant is said to be so acrid that in Jamaica the water taken from the tanks where it grows is so impregnated with acridity that it causes bloody flux."

This plant has the general appearance of a loose rosette of green leaves. These leaves are wedge-shaped, being broad and somewhat flattened at the apical end, and narrowly tapered at the basal end. Many have a central indentation at the apical end. On healthy plants the leaves are of firm texture and a bright green in color. They are thickly clothed with fine downy hairs. A small flower-bearing bract arises near the base of each foliage leaf. Each bract contains a male and a female flower attached to an adnate spadix. The flowers are very small, white, inconspicuous and unisexual. The male flowers are arranged in whorls with two very short stamens. The female flowers are solitary. The ovaries are single-celled and contain many small seeds. From near the base of each leaf there also springs a slender shoot or runner which extends away from the parent plant and develops a young plant at its apical end. Sometimes this young shoot plant becomes separated from the parent plant very quickly, but occasionally it in turn sends out its plant shoot before the connecting runner is broken. Thus at times three generations of plants may be found still attached to each other, although this does not commonly occur.

The roots of a large plant consist of innumerable long, slender, feathery filaments.

Upon the bursting of the seed pods the small seeds drop down beneath the surface of the water, lodging in the root masses if the plants be closely packed; if not, they sink to the bottom. After remaining in the water for approximately ten

days, each seed germinates a small leaf. Upon first issuing forth this is nearly round in shape, about 1 mm. in diameter, and resembles a tiny green ball. This leaf continues to grow under water until about the third day, when it is usually 3 or 4 mm. in diameter. It then slowly rises to the surface of the water and is soon floating buoyantly. A second leaf usually makes its appearance on the first or second day after the young plant has reached the surface. Several slender, threadlike rootlets also make their appearance soon after the surface has been reached, and extend downward in the water. About every five or seven days thereafter a new leaf adds itself to the formation of the rosette. On a 14-day-old plant of average size the leaves are about 10 mm. long, 8 mm. wide, and the rootlets about 15 mm. in length. The growth is very rapid and in a few months a plant attains a diameter of from 5 to 8 inches, and may have several runners, with young sprout plants attached, fastened to it.

Older and larger specimens may be found having from 16 to 20 leaves, some of the latter being from 7 to 10 inches in length. The roots attain a length of 3½ feet, and open out sufficiently to form a bulky mass below the surface of the water.

In new locations these plants grow in great numbers in the quiet water near the shore, where they are protected from the winds and currents. They multiply so rapidly that large masses are soon formed. Strong winds, or heavy rains, causing an elevation of the water, tend to set these floating masses of plants in motion, and they drift about on the surface of the water with the action of the winds and currents, until they are again swept into protected coves or lodge between the dead trees in the inundated area. Here the masses continue to enlarge and each day finds a little more of the surface of the water covered with a bright green carpet of *Pistia*. When we consider that propagation occurs both by seeds and runners, an idea may be formed of the rapidity with which it multiplies.

During the dry season there is a noticeable difference in the

appearance of the plants. At this period of the year the large outside leaves drop over on the surface of the water and slowly decay. The smaller leaves in the center of the plant remain alive, but their growth is very slow. The usual bright-green color gives way to a lemon yellow. Plants that measure 14 and 16 inches in diameter during the wet season diminish in size to 6 inches, or even less, during the dry season. Many of the filamentous roots also seem to decay and drop off during the dry season. During this time large plants are often found having less than 10 per cent. of the number of rootlets that are usually present at other times of the year. From observations made we consider that these changes are caused by the dry hot winds, burning sun and lack of rain and moisture of the dry season. Apparently the leaves are unable to take up sufficient moisture from the water in which they grow to withstand the effects of the wind and sun for any length of time. A certain amount of rainfall seems to be necessary. Plants growing in small sheltered coves, where they are continually shaded from the sun and protected from the action of wind and current, remain green and vigorous throughout the year.

On nearly all arms of the lake that reach back into former river valleys, portions of the surface will be found thickly covered with *Pistia* plants. In the Cano and Pescado River regions tightly packed masses of plants extend over the surface from shore to shore, covering the water for mile after mile. In the lower parts of the Pelanque, Aguadiente and Chilibre districts several square miles of *Pistia* may be found. The lake portion of nearly every river region on either side of the lake has its quota of plants.

We have made soundings at points in the Cano River district where these plants were so thickly massed together on the surface that it was necessary to separate them in order to see the water, and found a depth of 34 feet under them. However, although growing and rapidly multiplying on the surface of deep water, they reach a greater degree of luxuriance when in shallow pools of stagnant water, bordered by thick forest growths which afford shade. In places of this

character the plants grow very large. The rootlets become very numerous, forming large heavy masses, and are usually well covered with decayed vegetable debris. On one plant taken from such a locality 51 larvae of *M. titillans* were found attached to the rootlets.

That the *Pistia* plant is essential to the existence of *M. titillans* in the larval stage might be well assumed, and is in fact rendered highly probable by the simultaneous increase of both the plant and mosquito in the Canal Zone following the formation of Gatun Lake. However, we strongly suspect that this species may occasionally be found attached to the roots of other aquatic plants. A few larvae closely resembling *M. titillans* have been found attached to the roots of grasses, sedges, etc., of aquatic nature. These larvae were too small for positive identification and when placed in jars died in a few days. It is possible that they may have been larvae of another species of *Mansonia* very close to *titillans*.

As far as known at present no morbid conditions have been credited to this mosquito. However, should it ever become certain that this species is concerned with the transmission of disease in the Canal Zone, it will then be necessary to take steps for its elimination. This can only be accomplished by clearing the Zone of the water lettuce. When we estimate the number of square miles of this plant that may be found floating on the surface, we would on first reflection be justified in considering that its eradication would be an undertaking of considerable magnitude, but in reality it could be accomplished under quite reasonable conditions. The most feasible plan for the destruction of these plants is spraying with an arsenical solution. They are readily killed by arsenical sprays and will decay and sink in from 6 to 8 days after the spray has been applied. This work would require a house-boat, steam launch, pump-boat and about three pangas, or row boats. A crew consisting of one white man and from eight to twelve negroes would be necessary. An outfit of this kind should spray about an average of 35,000 square feet per day when the plants are in good-sized masses. The initial cost of the outfit would be

the most expensive part of the campaign, as the maintenance would be but slight in comparison with the work accomplished. However, this work will probably never be undertaken in the Canal Zone unless *M. titillans* is strongly incriminated in the transmission of some disease injurious to man or domestic animals.

Throughout our observations we have diligently searched for insects destructive to this plant, but up to the present time we have found but one natural enemy. This is the larval form of a small moth, *Samea multiplicalis* Guen. These small, worm-like larvae tunnel into, and feed upon, the foliage leaves, destroying large numbers of them. However, the plants multiply so rapidly that the destruction caused by these larvae is seldom obvious. It is to be deplored that this destruction is not excessive enough to produce results in diminishing the number of *M. titillans* in the Canal Zone.

An Annotated List of Gainesville, Florida, Coleoptera.

By H. L. Dozier, University of Florida.

The following annotated list is the result of extensive collecting at Gainesville, Florida, from January 1, 1916, to June 1, 1917. Collections and observations were taken under all conditions and during all seasons of the year. These were made in the various ecological habitats, but the majority of the Coleoptera listed here are hammock insects, as the writer was conducting an ecological study of Florida hammock and pinywoods insects during this period.

The term "hammocks" is applied in Florida to the dense hardwood and cabbage-palmetto forests, as distinguished from the open pine lands and cypress swamps.

All specimens were collected by the writer unless otherwise designated. A number of records of Prof. J. R. Watson, Entomologist of the Florida Agricultural Experiment Station, are included and credited to J. R. W. Specimens designated Bio. Coll. are in the biological collection of the University of Florida.

The bulk of the determinations has been made by Mr. W. S. Fisher, of the United States National Museum, to whom I am especially indebted. Others who have determined material and to whom I wish to express thanks are as follows: W. S. Blatchley, C. A. Frost, Dr. E. A. Schwarz, J. J. Davis (*Lachnosterna*), J. A. Hyslop (Elateridae), and Dr. A. D. Hopkins (Scolytidae).

CICINDELIDAE.

Tetracha carolina Linn. Very scarce, June 4-8. Edge of piny woods, June 4 (J. R. W.).

Cicindela scutellaris var. **unicolor** Dej. Common in and along sides of roads.

Cicindela punctulata Fab. The most abundant species of tiger-beetle found here. Most abundant during June.

Cicindela dorsalis var. **media** Lec. A single specimen, May 6 (Bio. Coll.).

Cicindela abdominalis Fab. Taken at edge of piny woods (J. R. W.), April-June 14.

CARABIDAE.

Omophron labiatum Fab. Beneath arc-light, May 7.

Calosoma sayi Dej. Found during August in velvet-bean fields; predaceous on *Anticarsia gemmatilis*, June 24.

Pasimachus strenuus Lec. Met with occasionally beneath old logs, April 9-22.

Pasimachus subsulcatus Say. Beneath old logs, April 4.

Morio monilicornis Latr. Beneath bark of dead pine trees, March 1.

Dicaelus alternans Dej. A single specimen beneath log at Hogtown Creek, April 11.

Galerita janus Fab. Very common under old logs the year round.

Galerita lecontei Dej. Same habitat as above species, but not so abundant.

Casnonia pennsylvanica Linn. Roots of grass and at lights, May 13.

Lebia viridis Say. On *Salvia* leaf, May 15. May 15-June 12.

Callida decora Fab. Adults taken beneath bark of decayed oak stumps and limbs, Jan. 16-Feb. 4. Both adults and larvae abundant in velvet-bean fields during August preying upon caterpillar of *Anticarsia gemmatilis*.

Plochionus amandus Newm. A specimen taken in caterpillar's nest on *Osmanthus americanum*, Aug. 13.

Apenes sinuata Say. A specimen taken in leaf-tyer's nest (*Laverna sabellela*) on *Phoenix canariensis*.

Brachynus stigycornis Say. Beneath log, May 1.
Selenophorus palliatus Fab. Abundant at lights, June 7.
Euphorticus pubescens Dej. An unlabelled specimen.

GYRINIDAE.

Dineutes carolinus Lec. Abundant in water of streams and sinks.

COCCINELLIDAE.

Megilla maculata DeG. Not abundant.
Hippodamia convergens Guer. A very abundant species. Especially abundant on the bull thistle in April.
Coccinella sanguinea Linn. Abundant throughout most of the year.
Chilocorus bivulnerus Muls. Is found the year round and is probably the most useful native coccinellid here.
Exochomus childreni Muls. This small reddish species was abundant on oak foliage, April 16. At chinquepin blooms, April 29.
Exochomus contristatus Muls. An adult taken feeding on third-stage larvae of the citrus whitefly, Sept. 22.
Brachyacantha dentipes Fab. Taken on oak foliage, April 3-16.
Brachyacantha querceti Sz. Taken on buckeye foliage at Hogtown Creek, March 9. A specimen taken in buckeye leaf-roller's nest, feeding on the remains of the inhabitant which it had apparently killed, March 5. (J. R. W.).
Hyperaspis proba Say. One on hickory leaf, April 11.
Scymnus fraternus Lec. Very abundant during March in the blooms of *Crategus* and on the foliage of the buckeye.
Stethorus utilis Horn. Both adults and larvae of this species were very abundant on camphor foliage feeding on *Tetranychus yothersi* from Nov. 14-Jan. The larvae of this species are more or less garnet in color. A larva of *Chrysopa oculatus* was observed feeding upon a fullgrown larva.
Delphastus pusillus Lec. Adults were abundant on citrus foliage feeding on whitefly larvae, Oct. 13. A few of the dirty white larvae of this species were also observed feeding apparently upon the eggs of the whitefly on this date.

EROTYLIDAE.

Megalodacne heros Say. Several taken hibernating beneath loose bark of a large magnolia log, Jan. 25.
Tritoma festiva Lec. A number taken beneath bark of fallen oak, Feb. 13.
Tritoma thoracica Say. One on ash leaf, April 5.

DERMESTIDAE.

Anthrenus varius Fab. Taken at cherry laurel blooms by hundreds, Feb. 28-Mar. 2. Abundant in blossoms of wild plum, Mar. 16. Numbers in blossoms of *Crategus,* March 25.

Cryptorhopalum sp. Very abundant in blossoms of *Crategus,* March 25.

HISTERIDAE.

Platysoma carolinus Payk. Probably the most common species of histerid. Taken beneath pine bark of decaying log, Feb. 19.

Paromalus aequalis Say. Occurs rather abundantly beneath bark of fallen oaks, Feb. 7-Mar. 6.

DASCYLLIDAE.

Ora hyacintha Blatch. Two specimens taken at light, Sept. 7.

ELATERIDAE.

Adelocera marmorata Fab. A rather scarce species. Beneath bark pulled from decayed pine and oak trunks, March 1-9.

Lacon curtus Lec. Numbers on corn plants, Aug. 16. April 16-Aug. 16.

Alaus oculatus Linn. Is found wintering in the adult stage in decayed stumps in plentiful numbers.

Alaus myops Fab. Found in the same habitats as above species, but is not so abundant.

Monocrepidius lividus DeG. Found abundantly on the foliage of various trees and shrubs in the hammocks and on corn plants, March 15-Aug. 17.

Monocrepidius vespertinus Fab. Very abundant on corn plants and at lights in June. Varies greatly in markings.

Elater hepaticus Melsh. Six adults taken in decayed piece of wood suspended in small tree, Jan. 28.

Elater rubricollis Hbst. An undated specimen (Bio. Coll.).

Orthostethus infuscatus Germ. This beetle passes the winter in the pupal stage, issuing the latter part of April. The larva is cylindrical, very highly chitinized, with a thimble-shaped 9th abdominal segment. It is a typical inhabitant of decaying logs, where it is found the year round. Adults April 20-26.

Limonius pubicollis Lec. Numbers taken on buckeye, March 5-9. Taken on low shrub at Hogtown Creek, April 11.

Agrypnus sallei Lec. A single specimen, May 1. (Bio. Coll.).

Cebrio mandibularis Lec. Numbers taken in pouring rain on pavement the morning of June 8. These beetles were found on their backs, where they were struggling to upright themselves. It took them a long time to do this.

(To be continued.)

Dohrniphora venusta Coquillett (Dipt.) in Sarracenia flava.

By Frank Morton Jones, Wilmington, Delaware.

(Plate XVII.)

The abundant accumulated insect captures of our larger North American pitcher-plants offer a store of animal food, advantage of which is taken by quite a list of insects. Some of these are apparently habitual and necessary associates of the plants, while others, though they frequently avail themselves of this shelter and food-supply, have other habitual feeding-places. In the late summer the pitchers of *Sarracenia flava* no longer actively capture insects; the accumulated insect remains found in them at this season are more or less dry and fragmentary, and probably no special equipment of habit or structure is required by insects discovering this food-supply to evade capture by the leaf-trap. Among several species present in the pitchers at this time is the larva of a Phorid; from two or three to a dozen or more of these larvae may occupy a single pitcher; the puparia, too, are found among the insect remains, and the emerging flies mate and oviposit in captivity, so that a tumbler of dead grasshoppers is all the equipment necessary to obtain them in all stages. Professor C. T. Brues has kindly identified this fly as *Dohrniphora venusta* Coquillett, a widely distributed species occurring in both North and South America. Coquillett's description (Canadian Entomologist, XXVII, p. 107, 1895), purporting to be that of the female, is in reality that of the male (see Malloch, Proc. U. S. Nat. Mus., XLIII, p. 432, 1912); *divaricata* Aldrich has also been referred to this species. In view of the apparent dearth of knowledge of the life-histories of the Phoridae, the following descriptions of the egg, larva, puparium, and of both sexes of the imago as obtained from *Sarracenia flava* are here presented.

Egg.—Elongated oval, not quite symmetrical; white, pearly, slightly polished, minutely but not closely punctate, surface dry, non-adherent; size, .27 x .65 mm.; scattered singly by the ♀; in this stage (at 70 deg. Fahr.) three days.

Larva, last stage.—Length 4 mm.; dorsally flattened; brownish-white, unpolished, the texture roughened with fine sparse hairs which are short and microscopic except on the larger pointed processes; on each side the segments bear fleshy pointed processes, progressively larger posteriorly; dorsal area above these processes bears four evenly-spaced rows of lower smaller protuberances; the ventral surface bears six rows, still smaller, those of the outer row on each side papillate, of the inner rows low and inconspicuous; the posterior spiracles are in contact medially, ferruginous, in shape resembling short stout flasks, somewhat flattened; the head segment at its base on each side bears a single protuberance which consists of a stout bristly basal portion surmounted by a smoothly-rounded knob; the antennae (?) are minute, fleshy, apparently 2-jointed, and without setae; the head contains two chitinized parts or organs, the largest of which, a thin flat plate, brown in color, its margin rounded and entire and with two minute perforations near its anterior edge, is of almost equal area to the entire segment; beneath this is the cephalopharyngeal skeleton, which has one great hook with a low tooth on its under surface, and two prominent backward-pointing barbs above; when the skeleton is mounted on a slide, the slight pressure of the cover-glass causes these barbs and a pointed attachment in front of them to separate from the hook, and they are probably segmented to it; on the ventral surface of the succeeding segment is an 8-toothed labial (?) plate; this, with the cephalopharyngeal skeleton, seems to constitute the only chitinized mouth-parts. The larvae are usually so smeared and discolored with their moist and putrid food, which clogs and clings to their roughened surface, that their real structure is hidden; about sixteen days are spent in the larval stages.

Puparium.—Not greatly different in size and shape from the larva; in color, dull mahogany brown; the pointed processes of the larva, except the lateral row, almost obsolete; on the third day after the hardening of the larval skin and its change of color, two remarkable flat wand-like structures, their edges fringed with rigid cleft filaments, are pushed upward from the dorsal surface of the fourth segment, their points divergent, and become fixed in this position; the larva seems to possess no such extrusible organs, though two darkened areas on the second segment may indicate their location; these wand-like appendages of the puparium, whatever their office, apparently correspond to the thorn-like processes possessed by the puparia of some other species of the Phoridae. About sixteen days are passed in the pupal stage (at approximately 70 deg. Fahr.), though at summer temperature the transformations probably occupy less time than is indicated by these records from breedings indoors and under unnatural conditions.

Imago ♂.—Length 2-3 mm. Head black, almost opaque; front

with the usual fourteen bristles; three strong bristles below the eye on each side; palpi yellow, sparsely black-haired beneath, terminally with three upwardly directed and two downwardly directed bristles; antennae very finely pale pubescent, dark smoky brown above, below slightly paler, more yellowish; arista plumose, black or nearly black; proboscis (in dried examples) reddish-amber, not projecting beyond or below the palpi; oral margin shining brown; no conspicuous ocellar elevations or sutures; eyes finely pubescent.

Dorsum of thorax dark brownish-black, subshining and thickly set with short stiff backwardly directed black hairs; a strong upwardly directed bristle below the anterior spiracle; a supraalar row of four bristles, the first and last the stronger; four prescutellar bristles, the inner (dorsocentral) pair usually the weaker; scutellum naked, opaque, black, with two strong marginal bristles and a barely distinguishable outer pair; halteres pale dull yellowish-brown.

Legs, with their coxae and most of the pleurae, yellow; fore tibiae always with four, often with five, and sometimes with six rather weak setae spaced along the outside; middle tibiae spurred, and with a pair of strong setae below the knee, one comparatively weak subapical seta, and on the apical half a series of oblique rows of short, even, appressed hairs, from which area also spring stronger hairs; hind tibiae spurred but without other setae, though the hairs are longer and stronger along the outer edge; metatarsi of all legs with rows of short even hairs on the inside, this structure best marked on the posterior metatarsi, each of which bears about twelve such rows; pulvilli present but weak.

Wings almost hyaline; veins dark brown, the heavy veins nearly black; base of wing bristly and with three long plumose bristles on lower edge; bristles edging the costa stiff, and as long as the width of the thickened costal vein, which extends slightly beyond the middle of the wing; a single short bristle at the origin of the heavy portion of the third vein, which is distinctly forked; first longitudinal vein reaches the costa about three-fourths the distance from the humeral vein to the end of the thickened costa; mediastinal vein faintly marked; fourth vein up-curved, reaching margin about equally distant from tip of wing as the fifth; seventh vein weak, but readily distinguishable.

Dorsum of abdomen principally velvety black; the basal segment yellow, more or less black-margined posteriorly; the next segment anteriorly yellow, posteriorly black, with an angular backward projection of the yellow area on the median line; the three succeeding segments black, each with a small yellow triangular marking on the anterior edge medially; sixth segment broadly yellow anteriorly, posteriorly black; abdomen beneath, pale; hypopygium in fresh examples usually extruded, sometimes folded back beneath the abdomen; the

clasp-shaped organs are dark brown, the projecting finger-like organ (which in dried examples may be the only portion visible) yellow or pale amber, with fine black hairs; this organ often bears a solidified globule (indicated by dotted line in figure) of about the same color and texture, which might easily be mistaken for a portion of the insect.

♀.—The larger examples (dried) slightly exceed 3 mm. in length; colors of head and thorax, and chaetotaxy, practically identical with those of the ♂; the proboscis, in living or freshly killed material, is almost twice as long as that of the ♂, is horny, and is usually held vertically as shown in the figure; in dry examples it is drawn up obliquely or horizontally between the palpi, but exceeds them in length by fully its own width; in this sex the second joint of the antenna is usually visible and is yellowish-brown; the abdomen of the ♀ is more dilated and less strongly chitinized than that of the ♂, the longitudinal striations (indicated in the figure) are more marked, and the velvety black and yellow of the male are replaced by dull smoky brown; terminal joint of the hypopygium pale amber, usually drying to dark brown.

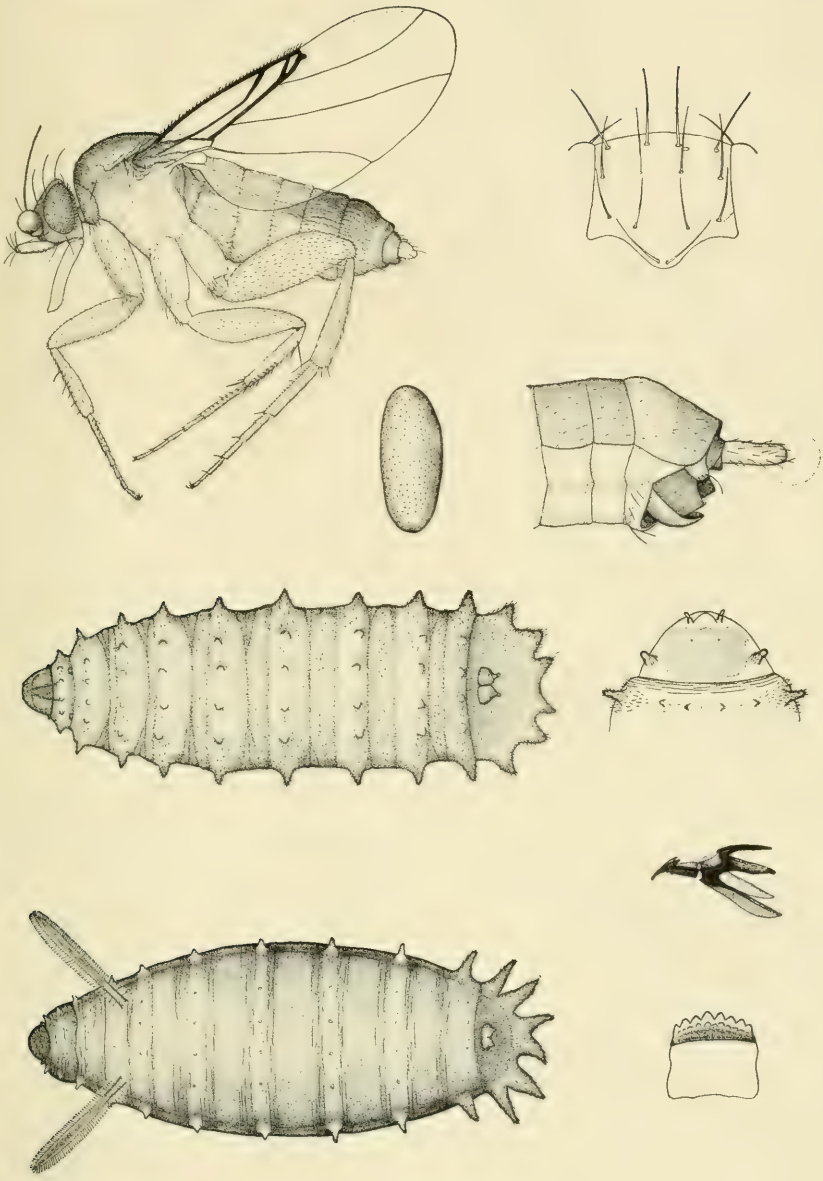
Described and illustrated from numerous eggs, larvae, and puparia, and from nine male and six female flies, bred from dead insects contained in the pitchers of *Sarracenia flava,* Summerville, South Carolina.

Explanation of Plate XVII.

Dohrniphora venusta Coquillett, female.
Front of same, showing arrangement of setae.
Egg.
Terminal segments male abdomen.
Larva.
Puparium.
Head segment of larva, further enlarged (from slide mount).
Cephalopharyngeal skeleton, same enlargement as preceding.
Labial plate, same enlargement as preceding.

The Rev. O. Pickard-Cambridge and His Collection of Arachnida.

According to the *Entomologist's Monthly Magazine* for August, 1918, a "Memoir of the Rev. Octavius Pickard-Cambridge" by his son, A. W. Pickard-Cambridge (Oxford printed for private circulation, 1918) has appeared, giving a biographical sketch and a "very complete bibliography of the scientific papers" of its subject. The "great series of Arachnida, with its numberless 'types' brought together during his long life and the extensive library of works relating to the class have found a final resting place in the Oxford University Museum and are now available to all students of the subject."



DOHRNIPHORA VENUSTA—JONES.

New Inter-Tidal Rock-Dwelling Coleoptera from California.

By Edwin C. Van Dyke, Berkeley, California.

Here and there along our Pacific Coast are to be found certain rocks which are so situated that they are submerged by the high tides. These harbor many types of true sea animals, but in their crevices, often such articulates as mites, chilopods, pseudo-scorpions, Thysanura and Coleoptera. It is a most interesting fauna and one to which I have given some little time, during recent years. As a result, I have secured, among other things, three new species of Coleoptera. The descriptions of these are now presented.

Carabidae.

THALASSOTRECHUS n. gen.

Body somewhat elongate, flattened, and moderately robust. The head large, not constricted behind the eyes, with shallow frontal grooves, and two supraorbital setae. The antennae moderately stout, arising under a feeble frontal ridge, the third joint slightly longer than the second, the first and second glabrous, the second and third shining and with few hairs, the following quite hairy, subopaque, and gradually increasing in width towards apex. Eyes moderate in size and well removed beneath from the mouth. Clypeus moderately prolonged and with a setigerous puncture each side. Labrum short, broadly emarginate, plurisetose in front. Mandibles prominent, prognathous, feebly arcuate, acute at tip, and with a small setigerous puncture at apex of scrobe. Maxillae slender, acute at tip, ciliate with a few stiff hairs on inner side, the outer lobe biarticulate, palpi of moderate length, the terminal joint gradually tapering, not subulate, slightly longer than preceding, and finely truncate at tip, the penultimate not hairy. Submentum broad, its basal suture distinct, deeply emarginate and with a broad bifid tooth at middle, the epilobes dentiform, ligula moderately prominent, truncate and bisetose at apex, the paraglossae slender and very little longer than the ligula and not ciliate within, the palpi of moderate size, the last joint fusi-

form, finely truncate at tip, not subulate, and longer than the preceding joint.

Prothorax with side margin narrow and a seta at the sides near the front and at hind angles. Body not pedunculate, scutellum distinct. Elytra elliptical, not margined at base, sides narrowly inflexed, margin posteriorly entire and without internal plica, disc without distinct striae, but with five or six well-marked dorsal punctures. Prosternum not prolonged at tip. Mesosternum declivous in front and sulcate, moderately separating the coxae, the epimera narrow. Metasternum short, the epimera distinct, the posterior coxae narrowly separated. Legs moderate in length, the tibiae not spinulose externally, the anterior deeply emarginate within, the inner spur almost at middle. Tarsi slender, claws simple. The anterior tarsi of the males with two joints dilated and squamulose beneath. Type of genus, *Trechus barbarae* Horn.[1]

This genus undoubtedly belongs in the tribe Pogonini, though it differs from all genera included within that tribe by Horn[2], by having the posterior coxae separated. Of the two groups composing that tribe, it superficially resembles most the Trechi, especially the typical genus *Trechus,* within which the type species was placed by its describer. It is, however, structurally much more closely related to the genus *Pogonus* of the group Pogoni, especially as regards its mouth parts. Its habits also more closely simulate those of *Pogonus.*

Thalassotrechus nigripennis n. sp.

Elongate, subdepressed, moderately shining, rufotestaceous, abdomen and outer joints of antennae somewhat piceous, elytra black excepting narrow marginal bead and epipleurae.

Antennae moderately stout, the ninth joint reaching the elytra, the outer joints gradually broader. Head finely alutaceous, impunctate, frontal depressions vague, eyes moderately prominent, mandibles prominent and porrect.

[1] "Random Studies in North American Coleoptera," by George H. Horn, M. D., Trans. Am. Soc., Vol. XIX (1892), p. 4.

[2] "On the Genera of Carabidae with special reference to the fauna of Boreal America," by George H. Horn, M.D., Trans. Am. Ent. Soc., Vol. IX (1881-2), p. 135.

Prothorax as long as head excluding mandibles, somewhat broader than long, base two-thirds width of apex, sides arcuate in front and almost straight behind, hind angles obtuse, lateral margin very narrow and not wider at base, apex truncate, disc smooth, with a fine longitudinal median line, the transverse lines and basal impression but vaguely indicated.

Elytra regularly oblong oval, almost one-third longer than head and prothorax together, humeri obtusely rounded, disc smooth, with but the vaguest traces of striae, six dorsal punctures. Body beneath smooth and shining. Length 5.5 mm., breadth 1.75 mm.

Type male and female in my own collection, collected at Moss Beach, San Mateo County, California, July 7, 1912 *Paratypes* to be deposited in the United States National Museum, Academy of Natural Sciences of Philadelphia, and California Academy of Sciences. Over a hundred specimens seen.

This beetle has been captured in the crevices of those rocks situated just below the high tide mark, at the mouth of Tomales Bay, Marin County, California, as well as at the type locality, and one specimen from Carmel, Monterey County, California, in the collection of Mr. L. S. Slevin, has been seen. It differs from *T. barbarae* Horn, a good figure of which has been given by Schaeffer[3], by being larger, by having the prothorax proportionately broader, especially in front, and by the color. The two species of this genus are not unique among the Carabidae in living in the inter-tidal area, for we have several closely related genera, such as *Aepus* with its three species, *A. marinus* Strom. and *A. robinii* Lab. from the south coast of England and west coast of Europe and *A. gracilicornis* Woll. from the island of Madeira; *Thalassophilus longicornis* Schaum, a species which, though normally a streamside beetle, is sometimes found on the seacoast of Europe and Madeira; *Thalassobius testaceus* Gay, a species from the seacoast of Chili; and *Ilaphanus stephensi* MacLeay, from Port Dennison, Australia, which is supposed to have similar habits, as it was found "under stones in black moist soil close

[3]"Synopsis of the Species of Trechus, with the Description of a New Species," by Charles Schaeffer, Bull. Am. Mus. Nat. Hist., Vol. XIV (1901), pl. XXVIII, fig. 6.

to the sea beach." Besides these, we also have certain of the Bembidii and some *Pogonus* which are normally submerged at times.

HYDROPHILIDAE.

Ochthebius lapidicolus n. sp.

Elongate, subdepressed, dull black with but the faintest tinge of bronzing, legs piceous. Head triangular, truncate in front, broader across the eyes than apex of thorax, front with two deep foveae, labrum with front margin broadly and shallowly emarginate.

Prothorax about one-fourth broader than long, apex barely emarginate, base narrower than apex and truncate, sides straight and strongly divergent from apex to prominent median angulation, then slightly sinuate and convergent to base, not serrate, lateral margin narrow in front, broader behind, and continued around on to both base and apex, not translucent, hind angles rounded, disc but slightly convex, with shallow median longitudinal and accompanying sinuous lines but with deep sulci at sides, the more elevated portions sparsely punctured and with minute white hairs in each puncture.

Elytra elliptical, almost one and one-half times as long as head and prothorax together, with a narrow margin running from base to near apex and without serration, disc faintly striate, the striae punctured with large, elongate, shallow, and rather distantly placed punctures, faint apically but more evident basally and at sides, each puncture containing a minute white hair. Beneath finely and sparsely punctured and pubescent. Length 1.5 mm., breadth 0.5 mm.

Type and *paratype* in my own collection, collected from the crevices of the inter-tidal rocks at Moss Beach, San Mateo County, California, May 1st, 1910. Paratypes to be deposited in the United States National Museum, The Academy of Natural Sciences of Philadelphia and California Academy of Sciences. Over fifty specimens examined.

This beetle, because of its elongated, depressed, subopaque, and but slightly sculptured surface, could not be confused with any others of the genus that have so far been described from this country. Its only close relatives are *O. lejoslisi* Muls. et Rey and its variety *O. subinteger* Muls. et Rey from the south coast of England and the west coast of Europe and *O. adriaticus* Ritt. from the coast of Dalmatia, which constitute the subgenus *Prionocthebius* Kunert and, like it, are true inter-tidal species. The first two, which I have seen

through the courtesy of Mr. H. G. Champion, and his father, G. C. Champion, differ from it by being generally larger, 2 mm. or over in length, evidently shining and submetallic, with prothorax but little narrower in front, the elytra with finely punctate striae, and by having the margins of both prothorax and elytra finely serrate.

EURYSTETHIDAE (AEGIALITIDAE).

Key for the Determination of the Species of the genus Eurystethes Scidl. (Aegialites Mann.).

Elytra evidently striate.

Head and thorax not shining and with but few and inconspicuous punctures.

Elytra deeply striate and without distinct punctures.

Head and thorax alutaceous, elytra shining, eyes not prominent, longitudinal thoracic line well defined. Length 3-4 mm. (Aleutian Is., S. E. Alaska, Queen Charlotte Is.)

californicus Mann.

Elytra shallowy striate and with small but distinct punctures.

Head and thorax coriaceous, elytra rugose, eyes very prominent, longitudinal thoracic line prominent. Length 3-3.8 mm. (Robben Is. off coast of Sakhalin Is.)

stejnegeri Linell.

Head, thorax, and elytra shining and with numerous well defined punctures, eyes quite prominent, thoracic line rarely evident. Length 2-2.5 mm. (Mendocino Co. and The Farallone Is., Cal.)

fuchsii Horn.

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[4]The family and generic names as here used are in accordance with the latest rulings on nomenclature. In 1845, Col. Motschulsky described *Elosoma persica* and *E.* (?) *californica*, in the Bull. Soc. Imp. Nat. Mosc. Vol. 18, p. 33. In 1853, Count von Mannerheim described *Aegialites debilis* in the Bull. Mosc. Vol. 26, p. 180. This last was later found to be the same as *E.* ? *californica* Mots. and so had to be reduced to synonymy but because of the belief that *persica* and *californica* were not congeneric, the generic name of *Aegialites* was allowed to stand for *californicus*. Later rulings on nomenclature however made this invalid seeing that it had been previously employed to designate a genus of birds, so to remedy the defect, Seidlitz in the Deutsch. Ent. Zeit. for 1916, p. 127, proposed the name *Eurystethes* for the genus and *Eurystethidae* for the family. Therefore if we believe with him that *persica* and *californica* are not of the same genus and family, which I most decidedly do, we have no alternative but to accept the names proposed by Seidlitz.

Elytra without striae. Eyes very prominent, head, thorax, and elytra, alutaceous and subopaque, with punctures hardly evident, longitudinal thoracic line well defined. Length 2-2.5 mm. (Marin and San Mateo Cos., Cal.) **subopacus** n. sp.

Eurystethes (Aegialites) subopacus n. sp.

Oblong, dull greenish blue above, alutaceous, subopaque legs and under surface rufo-piceous, the femora somewhat greenish. Head flattened, minutely and sparsely punctate, with a short longitudinal frontal impression and a broad shallow one to the inner side of each eye; eyes small, coarsely granulate, and prominent; antennae just reaching posterior margin of thorax, somewhat club-like, the tenth joint transverse.

Thorax slightly broader than long, somewhat narrower at apex than at base, widest in front of middle, sides distinctly arcuate, disc slightly convex, with broad shallow median impression running from apex to near base, secondary impressions on either side just anterior to middle, and with a few widely scattered and barely perceptible punctures.

Elytra oval, truncate at apex, wider behind, without distinct striae and distinct punctures, and with four shallow transverse impressions giving them a wrinkled appearance. Pygidium exposed. Underside sparsely and finely punctured. Length ♂ 2 mm., breadth 1 mm., ♀ length 2.25 mm.

Type ♂ and ♀ in my own collection, taken at Moss Beach, San Mateo County, California, July 7th, 1912, from the crevices of the inter-tidal rocks. A third specimen was secured later on at the same locality and a fourth from near the mouth of Tomales Bay, Marin County, California.

This very distinct species, because of its subopaqueness and lack of elytral striation, could not be confused with any of the known species. As indicated in the key, its very prominent eyes, short body, and non-shining appearance, would suggest a certain relationship to *E. stejnegeri* Linell,[4] a species from the opposite side of the ocean. The only other beetle which has been associated with those mentioned in the table is *E. persica* Mots.,[5] a species undoubtedly not congeneric with them.

Mr. E. A. Schwarz and H. S. Barber, of Washington, have materially aided me in this paper by suggesting and looking up references for me.

[4]Canad. Entom. XXX (1898), p. 74.

[5]Bull. Mosc. XVIII (1845), p. 33.

Additions to Insects of New Jersey, No. 6.

By Harry B. Weiss, New Brunswick, New Jersey.

According to Mr. A. M. Nadler, the following changes and corrections should be made in the *Corrodentia* of the 1909 list: *Pterodella pedicularis* should be *P. pedicularia* Linn., *Amphientomum hageni* should be *Echmepteryx hageni* Pack., *Myopsocus lugens* should be *Lichenomima lugens* Hagen and *M. sparsus* should be *L. sparsa* Hagen.

I am greatly indebted to Mr. C. W. Leng, Mr. Harold Morrison, Mr. H. S. Barber, Mr. A. B. Gahan and Mr. A. A. Girault for identifications in their respective fields and to Mr. E. L. Dickerson, Mr. C. E. Olsen, Mr. A. M. Nadler, Messrs. Bischoff and Knitter and others for their kindness in notifying me of their findings.

Order CORRODENTIA.

Echmepteryx hageni Pack. Tenafly, numerous on bark of trees, coming out during and after a rain (A. M. Nadler).

Pterodela pedicularia Linn. Bergenfield, Sept. (A. M. Nadler).

Psocus leidyi Aaron. Tenafly, Sept., dead on log without bark (A. M. Nadler).

Cerastipsocus venosus Burm. Tenafly (A. M. Nadler).

Order HOMOPTERA.

Cerataphis lataniae. On palms in greenhouses.

Macrosiphum illinoisensis Shim. New Jersey, on wild grape (Jour. Agric. Res. vol. XI, p. 83).

Dialeurodes citri R. & H. Riverton, in greenhouse on *Gardenia.*

Aclerda tokionis Ckll. Riverton, May 15, on bamboo. Introduced from Japan (H. B. Weiss).

Acutalis tartarea, var. **semicrema** Say. Chester, Aug. 12 (E. L. Dickerson).

Dictyophara dioxys Walk. New Jersey (Bull. Brook. Ent. Soc. vol. XII, p. 70).

Catonia cinctifrons Fitch. W. Norwood, Aug. 28 (E. L. Dickerson).

Cixius misellus VanD. Chester, Aug. 12 (E. L. Dickerson).

Oecleus borealis VanD. Egg Harbor, May 16 (E. L. Dickerson).

Lamenia obscura Ball. Lakehurst, July 7 (E. L. Dickerson).

Draeculacephala noveboracensis Fitch. Great Piece Meadow, Aug. 5, Ramsey (Bull. Am. Mus. Nat. Hist., vol. XXXVIII, art. I, p. 6).

Draeculacephala inscripta VanD. Ft. Lee district, July 13 (Coll. Am. Mus. Nat. Hist.).

Draeculacephala angulifera Wlk. Little Ferry, Aug. 28 (F. M. Schott); Hornerstown, Aug. 18; Gt. Piece Meadow, Aug. 6; Little Ferry, Aug. 15; Bear Swamp near Ramsey, July 10 (F. E. Lutz).

Pagaronia tripunctata Fh. Nutley, Aug. (E. L. Dickerson).

Idiocerus scurra Germ. Irvington, New Brunswick, Bound Brook, Trenton, July, Aug., Sept., two broods. Breeds on poplar (Dickerson & Weiss).

Agallia immaculata Lath. Lahaway, May 30 (C. E. Olsen).

Macropsis virescens Fabr. var. **graminea** Fabr. Irvington, Plainfield, Bound Brook, Ridgefield, July, on poplar (Dickerson & Weiss).

Oncopsis distinctus VanD. Ft. Lee, Aug. (E. L. Dickerson).

Eutettix seminudus Say. Springfield, Sept. 9 (E. L. Dickerson).

Scaphoideus carinatus Osb. Norwood, Aug. 28 (E. L. Dickerson).

Empoasca trifasciata Gil. Trenton, Aug. 20; Irvington, July 31; Ridgefield. Breeds in poplar (Dickerson & Weiss).

Order HEMIPTERA.

Corythucha spinulosa Gibson. Jamesburg, July (Dickerson & Weiss). Rutherford, Wyckoff (E. L. Dickerson), on wild cherry.

Corythucha crataegi Morr. Oak Ridge (Weiss); Hackensack, Aug. (Dickerson), on hawthorn.

Corythucha parshleyi Gibson. Hammonton (Dickerson & Weiss), on walnut.

Hesperotingis antennata Parsh. Lakehurst, June 27 (H. G. Barber) (Psyche vol. XXIV, p. 21).

Leptostyla heidemanni O. & D. Delaware, Aug. 25; Lakehurst, July 19 (E. L. Dickerson). This should replace *L. oblonga* Say of 1909 list.

Cyrtorrhinus caricis Fallen. Lakehurst, Sept. 30 (H. G. Barber) (Canad. Ent. vol. 49, p. 250).

Lopidea reuteri Knight. Hewitt, Newfoundland, July (W. T. Davis) (Ent. News vol. 28, p. 459).

Lopidea heidemanni Knight. Westfield, June 4 (W. T. Davis) (Ent. News vol. 28, p. 456).

Lygus olivaceus Reuter. Manasquan, Sept. 13 (W. T. Davis) (Bull. 391, Cornell Univ. Ag. Exp. Sta.).

Lygus canadensis var. **binotatus** Knight. Havith, June 18 (W. T. Davis) (Bull. 391, Cor. Univ. Ag. Exp. Sta.).

Lygus plagiatus Uhler. Madison, Aug. 29 (W. T. Davis) (Bull. 391, Cor. Univ. Ag. Exp. Sta.).

Order COLEOPTERA.

Hydroporus dilatatus Fall. var. **suffusus** Fall. Eatontown, July 4, in running brooks (Sherman) (Jour. N. Y. Ent. Soc. vol. 25, p. 175).

Popilia japonica Newm. Riverton, July, Aug., on grape, cherry, rose, smartweed and various other weeds. Introduced from Japan (Dickerson & Weiss).

Chaetocnema quadricollis Schwarz. Arlington, Rutherford, on hibiscus (Dickerson & Weiss).

Phyllotreta (Haltica) armoraciae Koch. Chester (H. O. Marsh) (Bull. 535, U. S. Dept. Agric.). The horse-radish flea beetle.

Pachyphanes discoideus Lec. Sterling, July, on sneezeweed (Bischoff).

Anthonomus subguttatus Dietz. New Jersey, July (Rhyn. N. E. Amer.).

Pseudoanthonomus hamamelidis Pierce. Ramsey, Sept. 15 (Bischoff).

Auleutes cruralis Lec. Newark, Aug. 12; Sterling, Aug. 11 (Bischoff, Knitter).

Ceutorhynchus zimmermanni Gyll. Newark, June 24 (Bischoff, Knitter).

Ceutorhynchus semirufus Lec. Newark, June 5, on dandelion (Bischoff, Knitter).

Pelenomus griseus Blatch. Newark, June 24, in swamp (Bischoff, Knitter).

Baris interstitialis Say. Anglesea (Rhyn. N. E. Amer.). Appears in 1909 list as *Baris transversa* Say.

Limnobaris grisea Lec. New Jersey (Rhyn. N. E. Amer.).

Limnobaris bracata Casey. New Jersey (Leng). *Oligolochus robustus L.* in 1909 list is a synonym (Rhyn. N. E. Amer.).

Odontocorynus salebrosus Casey. Orange, April (Rhyn. N. E. Amer.).

Microcholus striatus Lec. Lakehurst, April 26 (Rhyn. N. E. Amer.).

Hylesinus rufipes Eich. Atco, April 9, on wild cherry (Wenzel) (Rhyn. N. E. Amer.). Appears in 1909 list as *H. opaculus.*

Order LEPIDOPTERA.

Acronycta wanda Buch. Union Co., June, Aug. (Ent. News vol. 28, p. 183).

Xylina patefacta. Lakehurst, Oct. 2 (Woodruff) (Jour. N. Y. Ent. Soc. vol. 25, p. 85).

Papaipema polymniae Bird. Elizabeth (Buchholz) (Canad. Ent. vol. 49, p. 121).

Nepticula paludicola Braun. Pemberton, New Lisbon, White's Bog, May, July, larva mines leaves of cranberry (H. B. Scammell) (T. A. E. S. vol. 43, p. 177).

Nepticula obscurella Braun. Montclair, larva mines leaves of bayberry (*Myrica carolinensis*). (T. A. E. S. vol. 43, p. 176).

Order HYMENOPTERA.

Pteronidea ventralis Say. Trenton, Rutherford, New Brunswick, larvae on poplar and willow. Eggs observed May 19 (H. B. Weiss).

Andricus gemmiformis Beut. Ft. Lee district. Bud-shaped galls on trunk of white oak (Beut.) (Canad. Ent. vol. 49, p. 346).

Bracon virginiensis Morr. Westville, Aug. 30. Should replace *Agathis haematodes* Br. in 1909 list. (Proc. U. S. Nat. Mus. vol. 52, p. 341).

Casinaria (Limnerium) limenitidis How. Rutherford, Aug. 1. Bred from cocoons collected at this locality. Parasitic on *Limenitis archippus* (Weiss).

Arthrolytus aeneoviridis Gir. Rutherford (Weiss). Bred from cocoons of *Casinaria limenitidis* How.

Megastigmus aculeatus Swed. Paterson, May 31, Rutherford. Bred from *Rosa multiflora* seed. Introduced from Japan (Weiss).

Pemphredon foxii Rohwer. Camden Co., July 27 (Bull. Brook. Ent. Soc. vol. 12, No. 5).

Order DIPTERA.

Diarthronomyia hypogaea F. Low. Irvington, Bound Brook, in greenhouses. Galls on leaves, petioles, stems, buds of chrysanthemum.

Neolasiopterus hibisci Felt. Rutherford, galls on hibiscus (Dickerson). Recorded from Staten Is. in 1909 list under genus *Choristoneura*.

Dioctria brevis Banks. Englewood (Psyche vol. 24, p. 117).

Tachytrechus laticrus Coq. Manahawkin, July 30 (Harbeck) (Ent. News vol. 29, p. 46).

Coenomyia ferruginea. Greenwood Lake, June 6; Alpine, May 3 (Davis Coll.). Hewitt, June 8 (Amer. Mus. Coll.) (Jour. N. Y. Ent. Soc. vol. 25, p. 134).

Notiphila nudipes Cress. Woodbury, July 7 (C. W. Johnson); Manahawkin, June 30 (H. S. Harbeck). (T. A. E. S. vol. 43, pp. 27-66). Replaces *N. bella* Lw. of 1909 list.

Notiphila olivacea Cress. Cape May, June 17 (Harbeck); Manahawkin, Aug. 3; West Orange, June 1 (Harbeck) (T. A. E. S. vol. 43).

Notiphila riparia Meig. Salt Meadows, Aug. (Weidt, Harbeck) (T. A. E. S. vol. 43).

Notiphila cognata Cress. Manahawkin, June 30 (Harbeck) (T. A. E. S. vol. 43, p. 47).

Notiphila bispinosa Cress. Anglesea, Barnegat City, July 11 (Harbeck); Cape May, June 4, July 22 (Harbeck & Johnson); Stone Harbor, Aug. 8 (Harbeck) (T. A. E. S. vol. 43, p. 58).

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1918.

No Simple Life for Insects.

The more we learn of life, the greater do its complexities reveal themselves. It is doubtful whether we can assert of any organism that leads the "simple life." This is just as true of insects as of any other creatures. The discoveries of recent years as to the parts which insects play in transmitting causative agents of disease are but a beginning of that fund of biologic and ecologic knowledge which the next generation of entomologists, pathologists, bacteriologists, protozoologists and hygienists will possess. Confirmation of this view is furnished by observations published during the past few months, as where Turner has emphasized the carriage by Heteroptera and Homoptera of specific plant maladies, such as pecan kernel spot by the green soldier bug, *Nezara viridula,* and the recent announcements from both English and American sources of the connection of trench fever with human lice. The famous example, cited by Darwin in the third chapter of *The Origin of Species,* "showing how plants and animals, remote in the scale of nature, are bound together by a web of complex relations," will, names changed, ultimately be true for many more insects than the humble bees of which it was first employed.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Emergency Entomological Service.

Owing to limited space in our pages and to the great variety of topics mentioned in Nos. 13 and 14 of the Reports of this Service of the U. S. Department of Agriculture, for July 1 and August 1, 1918, respectively, we give here a very brief notice of their most important contents only. (Compare the NEWS for July, 1918, pages 271-3.)

Further data on **Climatic Effects on Insects** are that white grubs are undoubtedly less abundant in parts of Indiana than in the Fall of 1917, a result ascribed to later appearance of the imagos in 1917, owing to cool weather, with consequently younger and less resistant grubs to meet the sudden freeze of last October. The cold of the winter of 1917-18 apparently killed only those joint worms which were in the upstanding stubble, not those in stubble lying in or near the ground.

From Massachusetts comes the statement: "Thus far [Aug. 1] this has been emphatically a Plant Louse Year," and similar experiences are reported as far south as Maryland, excessive drought intensifying the injury from **aphids** on many vegetables.

The **grains** have been seriously attacked by joint worms (*Cephus* sp.), the Hessian fly and the wheat midge in Ohio, and from New York to South Carolina; the first named insects have been very abundant in Indiana, Illinois and Michigan also, while in Oregon aphids have been the chief pests of wheat and oats.

Several new species of **insects attacking cotton** have appeared near Victoria, Texas, this year, increasing the total over previous years. The red spider [*Tetranychus gloveri*] has done serious damage to cotton in South Carolina and Georgia, while *T. telariae* has been destructive to fruits and beans in California.

Grasshoppers have been a great plague from Wisconsin to California and Texas. The species mentioned are chiefly *Melanoplus differentialis* and *devastator*. "In southwestern Kansas...in some fields the dead grasshoppers [from the use of poisoned bran mash] are so thick that the stench is very bad. In some oat fields where the grasshoppers have come in from surrounding pastures and meadows, they are so abundant as to actually give the field a reddish tint, especially in the evening when they crawl up the stalks to roost."

Cutworms are credited with "an immense amount of damage" in South Dakota, and have been troublesome eastward to New Jersey and also in Texas.

Widespread injury by the **banana root borer** in Florida has led to co-operation by the State Plant Board and the Federal department for its extermination. **Castor beans**, now of importance as a war crop, have been seriously damaged in the same State by **army worms**. A research station of the department has been established in the Panama Canal Zone on account of the known occurrence of the **black fly** there and in Cuba, constituting a menace to citrus fruits in the Gulf States.

A curious case of injury to **hogs** is reported from the Russian River Valley, California, where **tent caterpillars** have been unusually bad, especially in prune orchards. Hogs have been killed by feeding on the caterpillars, their stomachs being completely filled with the silk of the tents formed into dense balls.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **3**—The American Naturalist, Philadelphia. **4**—The Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **9**—The Ento-

mologist, London. **13**—Comptes Rendus, Societe de Biologie, Paris. **18**—Ottawa Naturalist, Ottawa, Canada. **50**—Proceedings, U. S. National Museum, Washington, D. C. **51**—Novitates Zoologicae, Tring, England. **68**—Science, Lancaster, Pa. **87**—Bulletin, Societe Entomologique de France, Paris. **105**—Videnskabelige Meddelelser, Naturhistoriske Forening i Kjobenhaven, Copenhagen. **143**—Ohio Journal of Science, Columbus, Ohio. **161**—Proceedings, Biological Society of Washington, Washington, D. C. **179**—Journal of Economic Entomology, Concord, N. H. **180**—Annals, Entomological Society of America, Columbus, Ohio. **184**—Journal of Experimental Zoology, Philadelphia. **189**—Journal of Entomology and Zoology, Claremont, Calif. **195**—Bulletin, Museum of Comparative Zoology, Cambridge, Mass. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **204**—New York State Museum, Albany. **313**—Bulletin of Entomological Research, London. **292**—Insecta, Rennes, France. **322**—Journal of Morphology, Philadelphia. **344**—U. S. Department of Agriculture, Washington, D. C. **394**—Parasitology, Cambridge, England. **407**—Journal of Genetics, Cambridge, England. **411**—Bulletin, The Brooklyn Entomological Society, Brooklyn, N. Y. **417**—University Studies, Lincoln, Nebraska. **447**—Journal of Agricultural Research, Washington, D. C. **475**—Bulletin, Societe Vaudoise des Sciences Naturelles, Lausanne, Switzerland. **494**—Proceedings of the Royal Institution of Great Britain, London. **502**—American Museum of Natural History, New York. **507**—Occasional Papers, Museum of Zoology, University of Michigan, Ann Arbor. **513**—South African Journal of Sciences, Cape Town. **534**—Proceedings, California Academy of Sciences, San Francisco. **540**—The Lepidopterist, Salem, Mass. **553**—Florida Buggist, Gainesville. **559**—Leland Stanford Junior University Studies, Stanford University, California. **560**—Archivos da Escola Superior de Agricultura e Medicina Veterinaria, Pinheiro (E. do Rio), S. A.

GENERAL SUBJECT. Bordage, E.—Sur la constitution du reticulum du tissu adipeux secondaire chez les insectes metaboles. **87,** 1918, 124. **Comstock, J. H.**—Nymphs, naiads, and larva. **180,** xi, 222-4. The wings of insects, 430 pp. (The Comstock Pub. Co., Ithaca, N. Y.). **Crampton, G. C.**—The genitalia and terminal abdominal structures of male Neuroptera and Mecoptera, with notes on the Psocidae, Diptera and Trichoptera. **5,** 1918, 47-59. A phylogenetic study of the terminal abdominal structures and genitalia of male Apterygota, Ephemerids, Odonata, Plecoptera . . . and their allies. **411,** xiii, 49-68. **Fuchs, C.**—In memoriam. **534,** viii, 27-34. **Glaser, R. W.**—On the existence of immunity principles in insects. **5,** 1918, 39-46. **Harrington, W. H.**—Obituary. **4,** 1918, 181-187. **Newell, A. G.**—The comparative morphology of the geni-

talia of insects. **180,** xi, 109-56. **Pierce, W. D.**—A manual of dangerous insects likely to be introduced in the U. S. through importations. **344,** Office, Secty., 256 pp. **Robertson, R. B.**—Shooting larvae. **9,** 1918, 162. **Tragardh, I.**—On a new method of ascertaining the parasites of the respective host insects in a mixed infestation. **313,** ix, 75-9.

PHYSIOLOGY AND EMBRYOLOGY. Lancefield, D. E.—An autosomal bristle modifier, affecting a sex-linked character. **3,** lii, 462-4. **Sturtevant, A. H.**—A parallel mutation in Drosophila funebris, **68,** xlviii, 72-3. **Warren, D. C.**—The effect of selection upon the sex-ratio in Drosophila ampelophila. **198,** xxxiv, 351-71.

MEDICAL. Anon.—Guarding soldiers' camps against flies and mosquitoes, **68,** xlviii, 63-4. **Nuttall, G. H. F.**—Combating lousiness among soldiers and civilians. **394,** x, 411-586. **Winslow & Lutz**—Insects and disease. **502,** Guide Leafl. No. 48, 73 pp.

ARACHNIDA, ETC. Chamberlin, R. V.—The Chilopoda and Diplopoda of the West Indies. **195,** lxii, 151-262. **Emerton, J. H.**—Collecting notes for northern spiders. **18,** xxxii, 13. **Hartzell, A.** A chigger mite of Chrysopa larva. **179,** xi, 386. **Hull, J. E.**—Gynandry in Arachnida. **407,** vii, 171-81. **Mello-Leitao, Dr.**—Aranhas novas ou pouco conhecidas de thomisidas e salticidas Brasileiras. **560,** i, 117-154.

NEUROPTERA, ETC. Allee & Stein—Light reactions and metabolism in mayfly nymphs. **184,** xxvi, 423-58. **Cullen, Jamieson, etc.**—The rectal tracheation and rectal respiration of the larvae of Odonata Zygoptera. **1,** 1918, 75-113. **Gahan, C. J.**—The "death watch": notes and observations. **9,** 1918, 121-5 (cont.). **McGregor, E. A.**—Lipeurus dovei nom. nov. (Mallophaga). **5,** 1918, 46. **Rich, S. G.**—The respiratory rectum of the nymph of Mesogomphus (Odonata). **513,** xiv, 426-32. **Weiss & Dickerson**—Notes on Trioza alacris in New Jersey. **5,** 1918, 59-63. **Williamson, E. B.**—Two interesting new Colombian Gomphines (Odonata); Results of the University of Michigan Williamson expedition to Colombia, 1916-17. **507,** No. 52; No. 59.

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Braun, A. F.—New species (7) of micro-L. **4,** 1918, 229-36. **Cassino, S. E.**—A new form of Catocala sappho; New species [3] of Catocala. **540,** ii, 46-7; 52-4. **Comstock, J. A.**—Notes on the pola-minuta group of Melitaeas, with description of a new sp. **540,** ii, 55 (cont.). **Hampson, G. F.**—Descriptions of new genera and sps. of Amatidae, Lithosidae, and Noctuidae. **51,** xxv, 93-217. **Rothschild, L.**—Catalogue of Zerynthiinae and allied genera in the

Tring Museum, with critical notes. Catalogue of the Parnassiinae in the Tring Museum [1 new]. **51,** xxv, 64-75; 218-62.

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Cockerell, T. D. A.—(See under Coleoptera.). **Felt, E. P.**—New gall midges [6 n. sps.]. **179,** xi, 380-4. A study of gall midges—V. [many new]. **204,** Bul. 198, 101-268. **Hine, J. S.**—Notes on robberflies from southwest Texas . . . with a description of a new sp. of Erax. **507,** No. 61. **Malloch, J. R.**—Notes and descriptions of some anthomyiid genera [4 n. g.; 2 n. sps.]. **161,** xxxi, 65-68. Anthracophaga distichliae sp. n. **179,** xi, 386-7. **Melander, A. L.**—The dipterous genus Drapetis (Empididae) [many new]. **180,** xi, 183-221. **Parker, R. R.**—A new sp. of Sarcophaga from California. **189,** x, 32-3.

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pairing of Stylops. **8,** 1918, 129-31. **Pic, M.**—Deux nouveaux Poecilesthus (S. Am.). **87,** 1918, 123. **Sharp, D.**—On gynarchy in C. **8,** 1918, 154-5.

Cockerell, T. D. A.—New species of N. Am. fossil beetles, cockroaches, and tsetse flies. **50,** liv, 301-11.

HYMENOPTERA. Bordas, L.—Sur le regime alimentaire de quelques Vespinae (Vespa crabro). **292,** vii, 5-7. **Carr, E. G.**—An unusual disease of honey bees. **179,** xi, 347-51. **Graham, S. A.**—An interesting habit of a wax moth parasite. **180,** xi, 175-80. **Gautier, C.**—Etudes physiologiques et parasitologiques sur les lepidopteres nuisibles. La ponte des Apanteles, parasites de Pieris brassicae. **13,** lxxxi, 801-3. **Johnson & Ledig**—Early specimens of H. from the Claremont-Laguna region. **189,** x, 23-6. **Malloch, J. R.**—Occurrence of a European solitary bee (Andrena wilkella) in the eastern U. S. **161,** xxxi, 61-64. **Viereck, H. L.**—Notes on the bee genus Andrena. A list of the families and subfamilies of ichneumon flies or the superfamily Ichneumonoidea. **161,** xxxi, 59-60; 69-74. **Turner, R. E.**—On Braconidae parasitic on Diatraea saccharalis in Demerara (S. A.). **313,** ix, 81-2.

Fenton, F. A.—The parasites of leaf hoppers. With special reference to Anteoninae [6 new]. **143,** xviii, 243-78. **Mickel, C. E.**—New species of Sphecoidea from the central and western states. A synopsis of the Sphecoidea of Nebraska. **417,** xvii, 319-456.

Doings of Societies.

Feldman Collecting Social.

Meeting of April 17th, 1918, at 5614 Stewart St., Philadelphia, Pa. Twelve members present; Dr. E. C. Van Dyke, of Berkeley, California, visitor. Pres. H. W. Wenzel in the chair.

Coleoptera.—Dr. Van Dyke spoke of the intertidal collecting on the islands along the Pacific coast, particularly of the genus *Aegialites,* which is found in the crevices of the rocks below high tide line, so that part of the time they live under water. Associated with these was a marine Hydrophilid of the genus *Ochthebius* (the only species found in this country and undescribed), a Carabid related to *Pogonus* and many Staphylinids. They are all supposed to feed upon the minute algae. He had seen a specimen of a cave-dwelling Carabid at Cornell University, collected years ago by Prof. Comstock in Texas, which is not related to any of the North American or European species generally found in caves. It is eyeless, with a long thorax, long-headed and long-legged and is a new genus more closely related to *Casnonia.*

Diptera.—Mr. Hornig gave more details of his mosquito crusade. Mr. Laurent exhibited a large series of *Tabanus fuscopunctatus* Macq. which he said were very common and annoying the early part of this month at Gunntown, Levy County, Florida.

General.—Mr. Laurent said collecting was not so good this year in Levy County, Florida, but he had succeeded in getting a couple hundred each of Coleoptera and Lepidoptera. He exhibited also a picture of Ottomar Reinecke, who died November 26th, 1917.

Meeting of May 15th, 1918, at the same place. Ten members and one visitor present, President H. W. Wenzel in the chair.

Coleoptera. Dr. Castle exhibited a peculiar small Staphylinid of the genus *Micropeplus* which he had colllected on his last trip to Miami, Florida, May 5.

Diptera. Mr. Hornig stated that he had found a tree with a depression where the three main branches started from the trunk, which contained damp leaves but no water. These leaves were taken home and examined with a microscope but he could find no eggs; they were placed in a jar and covered with water and it now contains about twenty mosquito larvae. Recorded the first local appearance of the following: *Aedes canadensis* Theob., March 26th to April 30th, *A. sylvestris* Theob., April 1st to April 30th and *A. sollicitans* Walk., April 15th to May 9th.

Geo. M. Greene, *Sec'y.*

OBITUARY.

William Hague Harrington, born at Sydney, Cape Breton, Nova Scotia, April 19, 1852, died at Ottawa, Canada, March 13, 1918. From 1870 to 1916 he served in the Canadian Post Office Department. He was one of the founders of the Ottawa Field Naturalists' Club in 1879 and a member of the Entomological Society of Ontario since 1877; in both associations he held various offices, including the presidencies. His chief entomological work was on the Hymenoptera, but many articles from his pen on Coleoptera and on insects in general, especially those of economic importance, appeared in Canadian journals.—(From the obituary notice, accompanied by portrait and bibliography, in the *Canadian Entomologist* for June, 1918.)

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Friendly correspondence and exchange of Lepidoptera. Send your address and offerta. Will reply promptly.—F. E. Potter, 267 So. Main St., New Britain, Conn.

For Exchange—A few specimens, mostly Sphingidae and Saturniidae common to this region, for species from some other part of the country.—Dr. Elmer T. Learned, Fall River, Mass.

Lepidoptera—I have for exchange first class specimens of *Papilio floridensis, palamedes, Pholus fasciatus, tersa, hylaes, undulosa, Apatela tritona, Leucania pilipalpis, extincta, subpunctata, Gortyna u-album, Syneda graphica,* and hundreds of others from Pa. and Fla. Send lists, or address F. W. Friday, 82 Jacob St., Fair Haven, Pittsburgh, Pa.

Catocalae—For exchange perfect specimens of *C. pura, C. aspasia* and var. *sara, C. faustina* var. *lydia, C. praeclara.* Desire other *Catocalae.* Some of the common species wanted.—John H. West, 2057 E. York St., Phila., Pa.

Wanted in series for cash or exchange beetles of the genus *Serica* (Scarabaeidae) from all parts of North America. *Cicindela lincolniana* Casey among the exchanges offered. R. W. Dawson, Department of Entomology, University Farm, Lincoln, Nebraska.

Prof. Dr. Carlos E. Porter, Directeur des "Anales de Zoologia Aplicada," Casilla 2974, Santiago, Chile, is anxious to secure systematic papers on entomology, especially on the Thysanoptera, Coccidae, Aleyrodidae, Acarina, Chalcididae, Agromyzidae, Syrphidae and Longicornia. He will be glad to exchange specimens and publications.

Change of Address.—E. G. Titus from Logan, Utah, to Box 453, Idaho Falls, Idaho.

Wanted for Cash—Lowest insects of all families, preserved in fluid, for phylogenetic study. G. C. Crampton, Amherst, Mass.

Wanted—South American and Indian macrolepidoptera in exchange for Australian specimens in any order. (Rev.) H. S. Bodley, The Vicarage, Birchip, Victoria, Australia.

Wanted—A series of volumes of the Candian Entomologist including vols. 29, 30 and 31; also Ontario Entomological Society Reports, Nos. 2, 3, 4, 8 and 9. State condition and price wanted. M. H. Ruhmann, Vernon, British Columbia.

For Exchange—Have rare western Lepidoptera which I will exchange for butterflies, (North American preferred.) Send lists of your offerta.—Dr. John Comstock, 321 South Hill St., Los Angeles, Cal.

Wanted—Canadian Entomologist. Part xx of H. F. Wickham's Coleoptera of Canada or complete number of Can. Ent., xxix, Feb., 1897, containing same. Geo. M. Greene, 2534 W. Columbia Ave., Philadelphia, Pa.

Catocalae—For exchange; perfect specimens of *Faustina* var. *zillah, similis, gracilis.* Desire other *Catocalae.*—Ernest Baylis, 5011 Saul Street, Phila., Pa.

Wanted to Exchange—I wish to exchange Rhopalocera from eastern United States for those of the western and southern part. Correspondence desired. Paul N. Musgrave, 130 Oak St., Clarksburg, W. Va.

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jungle where the luxuriant growths furnish ample shade they will attack one as viciously during the day as at night time.

This mosquito is a persistent biter and thin clothing sometimes offers but little protection against them. A thin shirt, if it fits closely, is no defense against their attacks. They will also pierce heavy drill riding breeches, and if the attacks are directed at the knees—where the breeches are usually tight when one is sitting down—they can extract a meal of blood without much difficulty.

We have confined females of this species in a test tube and then applied the latter to the palm of the hand; the tough cuticle was pierced and engorgement took place as readily as on a thinner area of the skin.

When biting the female usually lowers her head and buries the proboscis as deeply as possible in the skin, meanwhile elevating the abdomen. As soon as the proboscis is inserted to its full length, the abdomen is lowered until the posterior end practically rests on the skin. The head is then raised and the proboscis slowly withdrawn until only the tip remains in the puncture. The alternate insertion and withdrawal of the proboscis, which may be likened to the action of a plunger in a pump, continues until the female becomes gorged. One female was observed to insert and practically withdraw her proboscis twelve times during a feeding of two minutes' duration. Although this is the usual mode of procedure in feeding, a few females have been noticed to insert the proboscis as deeply as possible and remain almost motionless, filling with blood slowly but steadily and occasionally expelling a few small drops of bloody fluid *per anum*. This sometimes continues for a period exceeding ten minutes. Although females confined in breeding cages when allowed to bite unmolested, are slow in becoming gorged as compared with other varieties of mosquitoes, they are very persistent and will gorge themselves nearly to the bursting point. One female was noticed to take blood very slowly, with the mouth parts deeply inserted, and became apparently full of blood in six minutes. She then withdrew the proboscis, walked about a little, and after expelling a few drops of dark-colored fluid from the anus, again inserted the proboscis and began taking more blood. She remained *in situ* ten minutes this second time. At the end of this period she walked up on the side of the cage and rested, apparently so full of blood that she was unable to fly.

(To be continued.)

These pages (269-272) to replace those misprinted in July, 1918, issue.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JULY, 1918.

"Making the Editorial of Greater Use to Entomology."

As a result of the editorial under this title in the NEWS for June we have received the following:

I noted in your editorial in the last issue of the Ent. News that you wished to know how the editorials might be "made of greater use and assistance to the progress of entomology." If in some way it would be possible for an editor to give information in his subject to those who wish to learn some of its phases with which he is unfamiliar, I am sure you would earn the "undying gratitude" of many a "would-be" investigator like myself, who knows little of what has already been done and lacks the necessary material to investigate phases of the subject which are worthy of further study. This, however, would place an undue burden on the editor; but if he could undertake to put the applicant into communication with some one who would be willing to give information or lend material, it would certainly be a great help to anyone in my position, who has no one to consult with other than those he chances to hear of, or takes the liberty of writing to, and whose material for study is limited to what he can collect, or cajole some more fortunate individual to lend him. I have found entomologists to be wonderfully sympathetic and ready to help to the fullest extent of their ability; but I know of others who dislike to appear so shamelessly bold as to ask favors from utter strangers, and have therefore gone without the needed material and information which my brazen "cheek" has obtained for me, but if these persons had some way of getting in touch with entomologists through the medium of your editorial columns or otherwise, I think this would help one class of investigators, at any rate. I must admit, however, that I am "speaking two words for myself, and one for the other fellow," and this proposition is so onesided, that I imagine most people would not care to bother with it. As far as my own material is concerned, I'd be only too willing to lend it to anyone who needs it, in order to help on the good work and to pass on the assistance I have so freely received from others, and if you know of anyone who needs material I would be glad to help him out as much as I am able.

The NEWS and its editors, through editorials or otherwise, will be glad to help our correspondents to get in touch with other workers whose assistance may be the one thing needful for the prosecution of researches on which they may be engaged.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Occurrence of the Damselfly Argiallagma minutum (Selys) in Southern Florida (Odonata).

In a small collection of dragonflies made by Mr. C. A. Mosier on Paradise Key, Royal Palm State Park, in the Everglades of Dade County, Florida, November, 1917, and deposited in the National Museum by the Bureau of Plant Industry, United States Department of Agriculture, through Dr. W. E. Safford, were two female specimens of this interesting little dragonfly. This appears to be the first record of the occurrence of this Neotropical species within the limits of the United States.

The species was described from Cuba in 1857. Dr. Calvert, in the Neuroptera volume of Biologia Centrali-Americana, pages 376-377, records it from Calisco, Cuba, (one male and one female collected by Poey) and from Los Amates, Guatemala, (one male collected January 16, 1905, by Mr. E. B. Williamson).

The monotypic genus *Argiallagma*, as stated by Dr. Calvert, belongs in the same division of the legion Agrion as do *Hyponeura* and *Argia*, but differs from those genera in that the long biserial hairs are less numerous (5-7 on the third tibiae), the postcubitals are fewer in number so that the nodal sector arises near the fifth postcubital on the front wings and near the fourth on the hind wings (origin of this sector one or more postcubitals farther distad in *Hyponeura* and *Argia*), and the female has an apical ventral spine on the eighth abdominal segment.

No doubt additional collections made in this picturesque section of Southern Florida will bring to light other interesting dragonfly records.—Rolla P. Currie, Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

Emergency Entomological Service. (U. S. Dept. Agric.)

In the following summary of number 12 of these reports, dated June 1, 1918, topics are arranged in the same order as that followed in the summary of number 11 (Ent. News, June, 1918, pages 234-236) for ease of comparison.

Climatic Effects on Insects.—At the insectary at East Falls Church, Virginia, little winter killing of wood-boring Cerambycid larvae was observed and data are given for the conclusion "that a continued low temperature is more fatal to these wood-boring larvae than fluctuating low temperatures and that the fatal low temperature is somewhere between 15-20 deg. [F.] below zero. Also there seems to be a greater mortality in exposed wood than in moist logs on the ground. The difference in humidity under these conditions may be an important factor." Milder winters around Washington seem to have more disastrous effects on the European Pine Sawfly (*Diprion simile* Hartig)

than the severe winter of 1917-18. The past winter is thought to have had no appreciable effect in decreasing or retarding the appearance of the tent-caterpillar near Washington, D. C.

Aphids.—"A few warm days in early April followed by a cool rainy April and a cool May have resulted in the most serious outbreak of aphids that western Oregon has experienced in recent years. Practically no type of crop or plant has escaped infestation and in the majority of cases the attack is extreme"; *Macrosiphum pisi* is especially mentioned. Experimental work to destroy the insects took several forms. A wooden drag, 10 feet long, 18 inches wide, pulled by a horse through 12 acres captured 140 pounds of aphids. A fungus, "*Empusa aphidis* Hoffman, is killing aphids in great numbers, but apparently only in limited areas." The same *Macrosiphum* is doing considerable damage to later pole varieties of peas in Louisiana.

"After an unusually mild and open winter, followed by a cool and rainless spring," *Macrosiphum creelii* appeared in great numbers on alfalfa near Fernley, Nevada. The rosy apple aphis is unusually abundant in the Rogue River valley, Oregon, and has done injury to apples in West Virginia; the green peach aphis, *Myzus persicae,* is abundant at Wenatchee, Washington. Complaints of the melon aphis (*Aphis gossypii*) come from California, Texas and Alabama, of the bean aphis (*A. rumicis* L.) from California, Ohio and New Jersey. In New Jersey, "the rosy apple aphis and other aphids of the orchard, especially *Aphis pomi,* received such a severe set back from the April snow and sleet storm that injuries are inconsequential." Apple aphids "are relatively scarce" in Connecticut. The non-appearance of aphids at Wichita, Kansas, up to May 16, is noted as unusual; they "are very scarce throughout the entire western part of Michigan."

Sweet Potato Weevils.—Observations on the Sweet Potato Weevil (*Cylas formicarius* Fab.) in flight are recorded, although it is believed not to fly long distances. Another weevil, which attacks this plant in Jamaica, has been found on *Calonyction aculeatum* and *Ipomoea pescaprae* at Moore Haven, in extreme southern Florida. It is *Euscepes porcellus* Boh., very closely related to the so-called sweet potato "scarabee" (*E. batatae*).

Control of the **Colorado potato beetle** in Louisiana appears to be succeeding.

Damage by the **chinch bug** in Texas will depend much on weather conditions; in some counties they are very abundant.

In May, in York County, Maine, **Lachnosterna tristis** "visited shade trees in such numbers that their flight made a noise that exceeds that of a dozen swarms of bees . . . a very unusual record for Maine."

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